Course Syllabus
Gyanmanjari Diploma Engineering College
Semester-2

Subject: Mathematics - DETXX10106

Type of course: Basic Science

Prerequisite: Basic of algebra, Trigonometry, Geometry

Rationale: Mathematics is to support struggling students in developing a solid mathematical foundation, fostering confidence and motivation, closing achievement gaps, and equipping them with essential skills for future academic and personal success.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks					Total Marks
				Theory Marks		Practical Marks		CA	
CI	T	P	C	ESE	MSE	V	P	ALA	
4	0	0	4	60	30	10	-	50	150

Legends: CI-Class Room Instructions; T – Tutorial; P - Practical; C – Credit; ESE - End Semester Examination; MSE- Mid Semester Examination; V – Viva; CA - Continuous Assessment; ALA- Active Learning Activities.

Course Content:

Unit No.	Course content	Hrs.	% Weightage
1	**Chapter-1: Determinant** Determinants: Second order, Third order and their values, Minors and cofactors with examples. **Chapter-2: Matrix** Introduction of Matrix and its types, Matrix operations: Addition, Subtraction, Multiplication of matrix with a scalar and with another matrix, inverse of a matrix.	15	25
2	**Chapter-3: Functions** Introduction of Functions, types of functions, Logarithmic and Trigonometric functions with properties, Formulas and examples. **Chapter-4: Limit** Introduction of Limit, Properties of limits, Standard limits and examples.	15	25
3	**Chapter-5: Differentiation** Derivative by first principle, derivative of sum, difference, product and quotient of functions, Derivatives of standard functions (without proof), chain rule, derivative e of functions expressed in parametric forms, second order derivatives.	15	25

4	**Chapter-6: Integration** Integration as an anti-derivative, Integration of standard functions, Integration by substitution and by parts, Basic properties of definite integrals and examples.	15	25

Continuous Assessment:

Sr. No.	Active Learning Activities	Marks
1.	**GeoGebra an interactive math tool:** Solve Mathematical problems given by teacher with graphical visualization using GeoGebra open source interactive math tool and submit the solutions to the GMIU web portal.	10
2.	**Functionality of scientific calculator:** List of functions will be assigned by teacher. Students have to prepare the flowchart for solution and upload to the GMIU web portal (in group of three students).	10
3.	**Puzzle:** Various problems based on series, geometry, clock, calendar etc. will be assigned to the students. Students need to submit Mathematical logic and solution via GMIU web portal (in group of three students).	10
4.	**Chart using Excel file:** Student need to prepare data charts like pie chart, line chart, column chart, bar chart, XY (scatter) chart etc. based on various data given by faculty and submit the Excel file via GMIU web portal (in group of three students).	10
5.	**Problem Solving:** Faculty will provide Mathematical problems and Students have to solve and write solution on word file and submit it on GMIU web portal.	10
Total		**50**

Course Outcome:

After learning the course the students should be able to:	
CO1	Apply mathematical tool for practical applications of matrix theory in fields such as Image processing, computer graphics, signal processing and Machine learning etc.
CO2	Define, understand, and work with various types of functions, including linear, quadratic, polynomial, exponential, and trigonometric functions.
CO3	Understand the concept of a derivative as a measure of the rate of change or instantaneous rate of change of a function at a given point.
CO4	Use integration to solve problems involving area under curves, work done, volume of solids of revolution, and other real-world applications.

Suggested Specification table with Marks (Theory): 60

Distribution of Theory Marks (Revised Bloom's Taxonomy)						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage	30%	40%	20%	05%	05%	-

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Instructional Method:

The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MCQ etc.

From the content 10% topics are suggested for flipped mode instruction.

Students will use supplementary resources such as online videos, NPTEL/SWAYAM videos, e-courses, Virtual Laboratory

Reference Books:

1. Basic Mathematics by Serge Lang.
2. Mathematics: A Complete Introduction by Hugh Neill.
3. Pre-algebra and Introductory Algebra by Richard N. Aufmann and Joanne S. Lockwood.
4. Basic Math and Pre-Algebra Workbook for Dummies by Mark Zegarelli.